

# THE AMERICAN JOURNAL OF PHARMACY

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MAY, 1906.

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## NOTES ON THE NEW PHARMACOPŒIA.<sup>1</sup>

BY W. M. SEARBY.

Before proceeding to discuss the Pharmacopœia, which is to be my principal theme this morning, I want to say a few words to the members of the Junior Class. Some of you have perhaps come here under the impression that the work is very easy, and that the Faculty and Instructors will do most of it for you. Others are impressed with the opposite view, that the work is attended with much difficulty, and that only very bright students have a good chance to graduate. Let me say to you that both of these views are erroneous. The work in college is not so easy that any of you can do it without effort, and graduate with credit. The Faculty will give you every assistance in their power to acquire the knowledge which you have come here to obtain. They will render the pursuit thereof as easy as it is wise to make it, perhaps as easy as possible, but there is a great deal that they cannot do. They do not demand much of you in the way of memorizing, but nevertheless there are some things which must be committed to memory, and this the Faculty cannot do for you. There is also a certain amount of reading and thinking which has to be done if you would have a comprehensive knowledge of the various subjects which will be presented to you. The Faculty cannot do your reading, they cannot do your thinking, and it is not all so very easy that anybody can do it with half trying. The work must be done systematically, promptly, day by day, if you would have a clear understanding of all matters submitted to you, grasp them thoroughly, and make

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<sup>1</sup> An address delivered before the student body of the California College of Pharmacy, September 7, 1906.

them a part of yourself; and nothing short of this will satisfy the Faculty. Nothing short of this should satisfy you.

To those who are laboring under the opposite impression, namely, that the work will be so hard that only bright students can master it, let me say that this view is also wide of the mark. For thirty years I have been teaching in this College, and I have seen students who are anything but bright make a most creditable record in their various branches of study. I have seen the fable of the hare and the turtle verified many times, the quick fellow coming in behind the slow one. Patient, persistent application has often achieved more under my observation than brilliant abilities; but this has called for self-denial and effort; and when these have been duly exercised, the result has been success.

Two men have been before the world the last few months, perhaps more than all others, President Roosevelt and Admiral Togo. Neither of them would have been where he is now, neither of them would have rendered to his country the invaluable services which he has given but for the fact that both of them exercised, in their early career, a remarkable degree of self-denial. When President Roosevelt was a youth, he was handicapped by poor health. He had wealth, and might have indulged himself, as most wealthy invalids do, but he preferred to make a vigorous effort to overcome his disability. He took up the life of a cowboy, exposed to heat and cold, fatigue and hunger, and everything from which the ordinary invalid would shrink. The luxuries of the table, of the cosy home, of the downy pillow, and all the coddling which he might have had, if he had given way to his infirmity, he threw aside. By roughing it, as we call it, for several years, he became strong and vigorous. He found more real pleasure in the strenuous life than in one of ease and indulgence. The result was that, when he went back to the activities and strain of city life, he was hardy enough to undertake them. His whole life from that date to the present has shown us that it is possible to make a vigorous, hearty, cheerful, buoyant, strenuous, energetic man out of an invalid. When he departed for Wyoming, he went to prepare himself for his life's work, and no adequate preparation can be made by any young man for a career of great activity without self-denial and effort; but these will overcome almost all obstacles.

It is possible that President Roosevelt had extraordinary natural

abilities. I have never heard that this was the case. I am of the opinion that he owes his success more to his own efforts than to natural talent greatly above the average. But I want to speak to you now of a man who was never considered to have more than ordinary ability, and yet see what he has accomplished. I refer to Admiral Togo. At fifty-eight years of age he stands before the world as its greatest admiral. Let us look at his career. His parents seem to have been moderately well to do. His mother, a person of more than ordinary ability, up to his twelfth year gave him all the schooling that he had. From twelve to fifteen years of age, he studied under a teacher all the branches of knowledge and all the accomplishments which were taught in Japan at that time. "Friends of the family, who remember him as a boy, say that he was a diligent student, and that among the boisterous and turbulent boys of Satsuma, where he was living, he was distinguished for his modesty and quiet seriousness of demeanor; but no one who knew him, gave him credit for anything more than ordinary ability." When fifteen years old, he became a naval apprentice on a Japanese warship. When scarcely seventeen years old he was on board a man-of-war when some firing took place between some British and Japanese ships, and Togo appears to have been impressed with the gun-practice and tactics of the British ships, for he seems then to have formed the purpose to go to England for the purpose of studying naval science, and it is believed that that decision came as the result of the experience he had at this time. Accordingly, when twenty-two years of age, he went to Yokohama, and there began the study of the English language, meanwhile begging the Japanese government to send him as a naval student to Great Britain. Two years later he was sent, being one of a party of twelve. Of his life in England we have very little information, but he finally succeeded in obtaining a cadetship on the warship Worcester at Plymouth. Capt. Henderson Smith, who was then in charge of the Worcester, said this of Togo: "Togo was an excellent fellow. He was not what you would call brilliant, but a great plodder, slow to learn, but very sure when he had learned it, and he wanted to learn everything. He was a quiet, good, temperate young fellow, and as brave as a lion." It is a noteworthy fact that none of the people who knew Togo in the early part of his life, gave him credit for talent or exceptional ability of any kind. His English teacher in Yoko-

hama said of him. "He was a quiet, honest student, but *would never make any mark!*"

This is the man who has astonished the world with his achievements in naval warfare. To what does he owe his marvellous success? *To his perseverance and his ample preparation.* Togo noticed that men-of-war, when practicing, did their work in smooth water, at an average range of 2000 yards, firing at stationary targets. Somebody conceived, and most likely it was Togo, the idea of practicing in rough water, to hit targets also in rough water. This gives the actual condition of naval warfare. The Japanese began practicing at long range distances of four or five miles, and they attained astounding skill in hitting comparatively small objects at great distances. Their ability in this way gave them a victory over the Russians who had twice the number of ships. In summing up a review of Togo's life, George Kennan lays great stress upon one thing as contributing to his extraordinary success, and that is "thoroughness in preparation," and it is this which I commend to you. It should not be difficult for you, gentlemen of the Junior Class, to see from the careers of President Roosevelt and Admiral Togo that self-denying and persevering application is all that you need to attain success as students in pharmacy.

Some of you have already learned something of natural science—of botany, of physics, of chemistry, or some other branch. You surely must have found that each new branch of science brought you some new pleasures. Vast are the possibilities in this line. How many hidden beauties there are in the natural world that are yet to be revealed to you. Dr. Lyman Abbott, one of our deepest thinkers, says "every new epoch in a man's education develops into activity a before dormant faculty, and opens for him a before closed world. The little child learns to *read*, and with this acquisition he is born into the world of literature of which before he could know nothing. He studies *art* under a wise teacher. He learns to see, to understand, and to appreciate beauty, and he is born into the world of art. He never was before. He studies *music*. Before, he had, as the saying is, no ear for music. His musical ear is born. He enters into still another world. Each new step in his development is a new birth. By the influence of music, art, and literature, he is lifted up into the world which they occupy."

We shall hope to help you to see a little more clearly into the



depths of these mysteries of science. We shall hope thereby to kindle in your breasts an enthusiasm in the pursuit of this kind of knowledge. Incidental to this, we shall hope to add to your happiness, to make life more to you, to make it richer, clearer, more beautiful, as you see and enjoy the beauties around you—the beauty of natural objects, the beauties of form, of color, of movement, beauties of natural law, of proportion, of relation of cause to effect. We shall hope to help you to use some of the knowledge thus acquired in the pursuit of your art. But do not make the mistake of seeking to practice your art until you have fully mastered the science upon which that art is based. Only by this course can you expect to be successful pharmacists.

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It has been the custom for a long time to speak of each different edition of the United States Pharmacopœia as that of the year of its revision. Thus we have the Pharmacopœia of 1820, 1850, 1880, and 1890, but inasmuch as it usually took from two to three and a half years to prepare each revision, it always happened that the work was issued several years later than the date which it bore. It has been thought best, therefore, to drop that method of designating the work, and to call it as in the present instance "The Eighth Decennial Revision." From the year 1820, when the first United States Pharmacopœia was issued, it has been revised every ten years, but the work of revision has in recent times been so laborious that it has taken a long time to get it ready for issuance. It may seem strange to some of you that it should have taken five years in the present case to revise this book, but a close examination will show that the amount of work to be done was very great. And when you remember that this work was done by twenty-five persons residing in some cases at great distances from their co-laborers, and that they had to be consulted about a thousand and one small details, you can see that this alone would occupy a great deal of time. But this is not all. Some changes have been made which have involved a great deal of technical work. For instance, specific gravities in the Pharmacopœia of 1890 were to be taken at  $15^{\circ}\text{C.}=59^{\circ}\text{F.}$ , they are now to be taken at  $25^{\circ}\text{C.}=77^{\circ}\text{F.}$  The reason for this change is that  $77^{\circ}\text{F.}$  is nearer the average temperature of stores and laboratories in which the specific gravities have to be taken. Solubilities in like manner are to be taken at  $77^{\circ}\text{F.}$ ,

and the determining of these solubilities has involved another large amount of work. In addition to this was the work of revising and improving formulas, processes, and chemical tests, every line of which had to be carefully considered. There should therefore be no criticism on account of its having taken five years to get out this work.

Another thing to be remembered in connection with this Pharmacopœia is that the date when it becomes official is marked on the title page, namely September 1, 1905. We are, therefore, supposed to be now dispensing all preparations of the strength of the new Pharmacopœia.

The *scope* of the Pharmacopœia has been modified by the following section in the general principles of revision:—

"The Committee of Revision is authorized to admit into the Pharmacopœia any product of nature of known origin; also any synthetized product of definite composition which is in common use by the medical profession, the identity, purity, or strength of which can be determined. No compound or mixture shall be introduced if the composition or mode of manufacture thereof be kept secret, or if it be controlled by unlimited proprietary or patent rights."

This section excludes phenacetin under its copyrighted name, but admits it under its chemical name of acetphenetidin. It excludes urotropin, which, however, can be sold and dispensed under its chemical name, hexa-methylen-amin; sulphonal can be sold and dispensed as sulphon-methane; and trional can be dispensed as sulphon-ethyl-methane; aristol under its chemical name, thymol-iodide; urethane under the name of ethyl carbamate; saccharine under its chemical name, benzo-sulphinide. Antipyrin is admitted under its patented name, because the patent has expired, and it is no longer necessary for any one wishing to prescribe antipyrin to write phenyl-di-methyl-pyrazolon.

These names seem to be unmercifully long. Yet an effort has been made to shorten them by dropping the Greek prefixes. Thus di-thymol di-iodide becomes thymol iodide. Diethyl-sulphon-methyl-ethyl-methane is shortened to sulphon-ethyl-methane. (Trional.)

It is doubtful whether any considerable use will be made of these sesquipedalian names. Either shorter names must be invented or we shall have to wait until the patents on these names have expired.

In the case of those which have been simply trade-marked, it is almost impossible to tell whether these will ever expire. There seems to be no limit to the duration of the trade-mark.

Another new feature in the Pharmacopœia is the introduction of *doses*. These are intended to be the average approximate doses for adults. The quantities are expressed in both metric and ordinary American weights and measures, the gramme being approximately the equivalent of 15 grains; 65 milligrammes of one grain; 250 milligrammes, four grains; one milligramme  $\frac{1}{64}$  of a grain, etc., etc. I have not had time to examine many of these doses, yet I noticed an apparent inconsistency in the dose given for syrup of squill and compound syrup of squill, the former being the equivalent of 1.35 grains of squill, the latter 2.4 grains of squill, which carries with it 2.4 grains of senega, and  $\frac{1}{2}$  grain antimony and potassium tartrate. The dose of the syrup of squill is too small, and that of the compound syrup considerably too large. The quantity there given would nauseate anybody who should take two or three doses. The first dose would have that effect upon most persons, yet it is not enough as an emetic.

Another noteworthy feature of the Pharmacopœia is the insertion of what is called the "*purity rubric*," by which is meant a definition of the degree of purity required for medicinal purposes. The reason for the introduction of this rubric is that in some States rigid laws have been enacted rendering pharmacists liable to severe penalties for selling drugs or pharmaceutical preparations below the standard of purity and strength of the U. S. Pharmacopœia. If absolute purity should be demanded, the cost of many drugs and preparations would be so greatly enhanced as to almost throw them out of the market. In the case of many chemicals, a small amount of impurity of an innoxious character is unobjectionable, and yet to remove that small amount would add greatly to the cost of the product. Thus, sodium bicarbonate may contain 1 per cent. of impurity. As that impurity consists almost entirely of sodium chloride and sodium sulphate, it is, of course, perfectly harmless. Sodium bromide and sodium citrate are required to have 97 per cent. of the pure salt; sodium hypophosphite, 98 per cent., sodium borate, potassium permanganate, potassium nitrate, and potassium iodide are required to have 99 per cent., while lead oxide is required to have only 96 per cent. In order that no unfair use should be

made of the Pharmacopœia in cases where pharmacists have sold drugs and chemicals for other than medicinal purposes, the following paragraph has been inserted in the preface :—

“Inasmuch as there has existed in the past on the part of the public a misconception of the purposes of a pharmacopœia, and penalties have been imposed upon those who have sold substances bearing pharmacopœial names which were to be used in the arts, for manufacturing, and other purposes, and not as medicines, it has become necessary to make the following declaration :—

The standards of purity and strength prescribed in the text of this Pharmacopœia are intended to apply to substances which are used solely for *medicinal purposes and when professedly bought, sold, or dispensed as such.*”

One of the most important features of the new Pharmacopœia is the insertion of *assay processes* for a number of drugs and their preparations in addition to those which were in the old Pharmacopœia.

The instructions from the Pharmacopœial Convention were “to append assay processes to as many of the potent drugs and preparations made therefrom as may be found possible, provided that the processes of assay are reasonably simple, both as to methods and apparatus required, and lead to fairly uniform results in different hands.”

The processes given, so far as I have been able to examine them, are as simple as they could be to secure the results desired. Yet I doubt not, many persons will question whether they are “reasonably simple.” It is to be borne in mind that this assay work requires some skill and care, and only persons reasonably skilled will be able to make reliable assays by any processes that may be given them. Processes have been introduced for the assay of the following drugs and their preparations :—

Aconite, belladonna leaves, belladonna root, cinchona, red cinchona, coca, colchicum corm, colchicum seed, conium, guarana, hydrastis, hyoscyamus, ipecac, jalap, nux vomica, opium, physostigma, pilocarpus, scopola, and stramonium. Some will think that the list should have been more lengthy, but it is a great gain to have even these.

Still another new feature in the Pharmacopœia is the introduction of diphtheria *antitoxin*, which is now official under the name of serum anti-diphthericum; also of dried *thyroid glands*, and *supra-renal capsules*.

While the Pharmacopœia contains 90 pages more than that of 1890, the number of articles which are now official is less by 34, 151 having been dismissed, and 117 new ones introduced.

Among those dismissed are some which the older pharmacists will regret, if only for association's sake, such as kermes mineral, Plummer's pill, turpeth mineral, emplastrum-de-vigo cum mercurio, massa copaibae, potassa cum calce, pulvis antimonialis, and last, but not least, to some of you, tobacco.

Among the new articles inserted in addition to the synthetics already referred to, we find acetone, trichloroacetic acid, ethyl chloride, hamamelis water, cresol, liquor cresolis compositus (resembling lysol), solid and fluid extract of scopola, three acetatracts (that is acetic fluid extract of lobelia, sanguinaria, and squill); guaiacol carbonate, iodol, kaolin, antiseptic solution (resembling listerine), liquor sodii phosphatis compositus (resembling melachol), methylene blue, liquefied phenol, compound acetanilid powder (a migraine or headache powder), saw palmetto (under the name of sabal), scopolamine hydrobromide, strophanthin, and vanillin.

A few of the more noticeable *changes in name* are the following:—

Arsenous acid is now more correctly called arsenic trioxide; chromic acid, chromium trioxide; carbolic acid is now known as phenol. Haloid salts of the alkaloids are now called hydrochlorides instead of hydrochlorates; hydrobromides instead of hydrobromates, etc. Ferri oxidum hydratum is now ferri hydroxidum, and the same nomenclature applies to the other hydroxides (sodium, potassium, etc.), resin plaster is now adhesive plaster, liquor potassæ and sodæ are now liquor potassii and sodii hydroxidi. Resorcin is now resorcinol. Salol is given its full chemical name, phenylsalicylate. Sodium hyposulphite is now thiosulphate. Sodium sulphocarbolate is now denominated as sodium phenolsulphonate. Chlorine water is no longer recognized as aqua chlori but as liquor chlori compositus. The preparation differs, however, from the chlorine water of 1890, being made from potassium chlorate, hydrochloric acid and water by the usual method of preparing chlorine water extemporaneously. It contains various compounds of potassium and chlorine as well as the free gas. Catechu is no longer found in the Pharmacopœia, its place being taken by gambir (*terra japonica*). I am at a loss to understand the reasons for this change,



as I have always preferred the catechu of acacia to gambir. I understand the reason to be that black catechu (cutch) was not always obtainable of good quality. I have never found any difficulty in this respect.

A change in name which will surely create considerable comment is the substitution of the word *fluidextractum* for *extractum fluidum*. The object of coining this peculiar word seems to have been to get all the fluid extracts together. This could easily have been accomplished, and in fact was accomplished in some of the earlier pharmacopœias, by adopting a heading for each series of preparations. This brought all of the fluid extracts, liniments, etc., together under their respective headings. To my mind this method is far preferable to the coining of such a word as *fluidextractum*.

Among the changes in regard to *strength and purity*, one of the most noticeable is that of alcohol, which formerly was required to have 94 per cent. of absolute alcohol. It is now practically 95 per cent., the exact requirement being 94.9 per cent. In like manner diluted alcohol, which was formerly required to contain 48.6 per cent. by volume, is now required to have 48.9 per cent.

A change that will be of more interest to some persons is in regard to whiskey, which in 1890 was entitled to recognition when it was two years old, but now must attain to the greater age of four years. Formerly it was required to have from 50 to 58 per cent. of absolute alcohol, while now it will pass muster at from 44 to 55 per cent. The preparation of 1890 was spelled whiskey; that of 1900 whisky. Hence, if you wish to sell an article that is less than four years old, and steer clear of any legal entanglement, you will label it whiskey; but if you wish to intimate that the article sold has the mellowness of mature age, you will spell the whiskey without the "e." There may be some persons who prefer the fiery ardor of youth to the mellowness and blandness of maturity, but connoisseurs will call for the official drink, because of its oil-like smoothness and clinging richness of flavor.

A similar change will be noticed in regard to white and red wine, which in 1890 were required to contain alcohol to the extent of from 12.4 to 17.3 per cent. They will now pass muster if they contain from 8.5 to 15 per cent. by volume.

The greatest number of *changes in strength* is to be found in the tinctures, 32 of which are different in this respect from those we

have been accustomed to make. An effort has been made to make the U. S. Pharmacopœia conform in regard to the strength of tinctures, acids, and some other preparations with those of European countries. This desire has led to the reducing of quite a number of tinctures from 35, 20, and 15 per cent. to 10 per cent. I will not enumerate them now, because you cannot remember them as I read them to you, but I will mention a few that should be memorized in view of the potency of the drugs:—

Tincture of aconite formerly 35 per cent. is now 10 per cent.

Tincture of veratrum formerly 40 per cent is now 10 per cent.

Tincture of nux vomica formerly  $12\frac{1}{2}$  per cent. is now 8 per cent.

Tincture of belladonna, colchicum, digitalis, gelsemium, hyoscyamus were formerly 15 per cent. are now 10 per cent. Three potent tinctures have been doubled in strength, namely cantharides, capsicum, and strophanthus, which were formerly 5 per cent. and are now 10 per cent.

A welcome *change in weight* is that of glycerin suppositories from 6 grammes to 3 grammes each. Another change in strength is that of syrup of iodide of iron from 10 per cent. to 5 per cent.

In regard to *processes*, the direction which was given by the Pharmacopœial Convention to adopt general formulas as far as possible, does not seem to have been carried out to any great extent. As a consequence 56 pages are taken up with processes for making fluid extracts, which would seem to be about 50 pages more than was really necessary. A general formula for preparing a few of these extracts would have sufficed, the menstruum to be employed in the making of the remainder is all that need have been given. Surely pharmacists in these days know how to make these preparations uniformly if the material and menstruum be given to them.

In regard to percolation, the changes made are in the way of improvement. The directions about sifting the drug previous to packing in the percolator are too often overlooked. The rate of flow is made much slower, ranging from 2 to 15 drops a minute according to circumstances.

I have spoken of those points in the new Pharmacopœia which seem to me the most noteworthy so far as I have come across them. I have not been able to examine the work thoroughly, but I have no hesitation in saying that the eighth Revision of the United

States Pharmacopœia is the best that has yet appeared, and that it is by all odds the best in the English language. There are a little more than 100 pages of most valuable matter that I have not yet been able to more than glance at. These are the tests, reagents, test solutions, volumetric solutions, directions for gasometric estimations and for alkaloidal assay, etc., followed by a number of tables of very great practical value in the laboratory, saving much time and calculation, and useful for many purposes. Too often this part of the Pharmacopœia is ignored, not, however, by scientific pharmacists.

I note with regret one omission, namely, the mention of the pharmacopœial preparations. It is a convenience to students to know what preparations are made from each drug, and if the Pharmacopœia is to be popular among physicians, as is most greatly to be desired, it would be acceptable to them to see at a glance what form of a remedy is official, that they might prescribe it accordingly. However, the general excellence of the work is such, and the difficulties of doing what has been done were so great, that, I think, words of commendation rather than of fault-finding should be given to the Committee of Revision, for they surely have done a great work.

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### BENJAMIN FRANKLIN.

HIS INFLUENCE ON THE PROGRESS OF THE SCIENCE OF MEDICINE IN AMERICA.

BY M. I. WILBERT,

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In looking back over the 200 years that have elapsed since the birth of Benjamin Franklin we must, of necessity, be impressed by the ever reappearing evidence that this printer philosopher of Philadelphia has left the impress of his theories and of his accomplishments on practically every phase of our present-day existence.

The long and eventful career of this early American scientist, extending from January 17, 1706, to April 17, 1790, a period of 84 years, appears like one continuous recitation of important occurrences. Even his humble beginning as an apprentice, in the printing office of his brother, in Boston, was not devoid of influence on the course of events in the Massachusetts colony.

It will not be necessary for me, however, to recount to you the various incidents in the career of this noted American, nor to call to your attention the numerous and the varied achievements that have had such an evident and such a lasting influence on the government, the industries and the arts of this country, as these are matters of general knowledge and are, or at least should be, familiar to you all.

While the political, philosophical, literary, mechanical and philanthropic achievements of Benjamin Franklin have been generally recognized, it does not appear to be so commonly known that this same Benjamin Franklin probably had a more direct and a more lasting influence on the progress of the science of medicine, in these United States, than any one other individual; certainly more than any one other layman.

In the course of my remarks I shall endeavor to recall to your minds at least some of these varied influences and to indicate how far-reaching have been the ultimate results.

Being ourselves primarily interested in the practice of pharmacy we may naturally ask what influences, if any, can Benjamin Franklin have exerted on the evolution of an art that was practically unknown in this country, in his time.

Apart from the fact that he himself contributed materially to introduce the practice of pharmacy into America, his influence, indirect though it be, on the origin and development of pharmaceutical education is probably most interesting.

All of you know how directly our present system of pharmaceutical education is dependent on the system of teaching introduced by the Philadelphia College of Pharmacy, some eighty-five years ago; but do you also appreciate that the direct incentive for organizing this College of Pharmacy was given by the University of Pennsylvania, the direct outgrowth of the College of Philadelphia, founded by Franklin about the middle of the eighteenth century?

The founding of the College of Philadelphia was, however, but one of a series of important occurrences that have contributed materially to enhance and to enlarge the sum total of medical knowledge.

Five years before the founding of the College of Philadelphia was actually accomplished, Benjamin Franklin had succeeded in establishing, in the city of Philadelphia, a society "for promoting useful

knowledge among the British Plantations." This society subsequently developed into the still existing "American Philosophical Society," and while it is true that it was probably the successor of Franklin's well-known Junto, established in 1827, there can be no doubt that the membership and the objects that were sought to be attained were more evidently of a general scientific character, rather than social or literary.

While it must be admitted that there is little or no evidence to show that the meetings of this society were regularly continued, they were, as Franklin himself has stated, "for the most part held occasionally at their own expense" and by far the greater portion of the practical work was done by correspondence.

From a letter written by Benjamin Franklin to Dr. Cadwallader Colden, of New York, in 1744, it would appear that the discussion of matters pertaining to medicine was expected to take an important part in the deliberations of this society. The list of active members, included in this letter, is headed by Dr. Thomas Bond, as physician, and also includes Mr. John Bartram as botanist and Dr. Phineas Bond as general natural philosopher.

Among the objects to be attained by the "American Philosophical Society," as outlined by Benjamin Franklin, in the proposal published under date of May 14, 1743, we find: The discussion of new methods of curing and preventing diseases, . . . the study of new-discovered plants, herbs, trees and roots, their virtues, uses, etc., . . . as well as the study of "all philosophical experiments that let light into the nature of things, tend to increase the power of man over and multiply the conveniences or pleasures of life."

Probably the most far-reaching as well as the most directly important contribution by Benjamin Franklin to the progress of medicine in America, is to be found in the part he took to establish the still existing Pennsylvania Hospital.

Undoubtedly the best available description of the inception and inauguration of this now venerable institution is to be found in Franklin's inimitable Autobiography. Here he relates how his particular friend, Dr. Thomas Bond, had conceived the idea of establishing a hospital, but that owing to a lack of appreciation of the uses of such an institution, on the part of the citizens of Philadelphia, little or no progress had been made.

Franklin further relates how he succeeded in awakening an interest



in the project and how, by the introduction of political strategy, he was able to secure from the members of the Assembly of the Province of Pennsylvania the provisional grant of a considerable sum of money to be applied to the founding, building and furnishing of the new institution.

This provisional grant by the Assembly was in turn used as an incentive for the citizens to increase their contributions and thus worked both ways.

Benjamin Franklin, in addition to being instrumental in founding the Pennsylvania Hospital, also acted as clerk to the Board of Trustees, for a number of years. In this latter capacity he prepared and published a history of the hospital "From its first rise to the beginning of the Fifth Month, called May, 1754." This history was designed to bring the institution to the attention of prospective contributors and appears to have been considered useful in this respect, as it was reprinted on several occasions, the last time in 1817.

So far as known this also appears to be the first attempt to record the history of an institution of this kind and may be considered as being the first history of medicine written or printed in the United States.

This brings to mind, too, that Benjamin Franklin appears to have been one of the first, if not the first, publisher of medical books and pamphlets in the British Colonies. As early as 1734 he published an edition of the "Poor Planter's Physician," under the title of "Every Man His Own Doctor, or the Poor Planter's Physician. Prescribing plain and easy means for persons to cure themselves of all or most of the distempers incident to this climate, and with very little charge, the medicines being chiefly of the growth and production of this country." This book was probably written by John Tennent and originally printed at Williamsburg. It was subsequently reprinted in several forms and also translated into German.

Among other medical publications from the press of Benjamin Franklin we find:

"An Essay on the Iliac Passion" by Dr. Cadwallader Colden, in 1741.

"An Essay on the West India Dry Gripes, with the method of preventing and curing that cruel distemper," by Dr. Thomas Cadwalader, 1745.

"A letter to a friend; Containing remarks on a discourse propos-

ing a preparation of the body for the small pox. And the manner of receiving the infection," by Dr. John Kearsley, 1751.

"*Medicinae Britannica*." "To which Mr. John Bartram has added a preface, notes, and an appendix containing a description of a number of plants peculiar to America, their uses, virtues, etc.;" also printed in 1751.

Throughout his long and varied career Benjamin Franklin appears to have had a predilection for the friendship of medical men. In addition to the brothers Thomas and Phineas Bond, Benjamin Franklin probably counted as friend or correspondent every prominent medical man in the British Colonies. In Great Britain itself Franklin's friends were numerous and influential. He was on intimate terms with such prominent men as John Fothergill, Sir William Watson, Sir John Pringle, William Heberdeen, William Hewson, Thomas Percival, William Cullen and Joseph Black. In France and on the Continent of Europe Franklin was known to, if not by, every prominent medical man who was in any way interested in the progress of the general sciences.

Through this wide and varied acquaintance with medical men of all parts of the civilized world Franklin was able to, and did, assist a number of American students of medicine who had gone to Europe to complete their medical education. Not the least noteworthy of these several students was John Morgan, a son of Evan Morgan, a merchant of Welsh descent, who had been a friend and neighbor of Benjamin Franklin, and had also been associated with him as a member of the Board of Trustees of the Pennsylvania Hospital.

John Morgan, after serving as an apprentice in the office of Dr. John Redman, was appointed and served one year as the second apothecary of the Pennsylvania Hospital; Morgan subsequently went to Europe, where, largely through the kindly assistance of Benjamin Franklin, who was then residing in Europe as the agent of the Pennsylvania Colony, he was brought in contact with and permitted to study under the leading men of the medical profession in London, and later in Edinburgh. It was no doubt due to his associations in the latter city that Morgan was led to conceive the idea of forming a medical school in connection with the College of Philadelphia, and at the same time to attempt to introduce the then novel practice of writing prescriptions and of having them compounded and dispensed by a regularly educated apothecary.

The medical school founded by Morgan, in addition to acting as an incentive for the establishment of other schools, has itself taken a most important part in the progress of the science of medicine in this country, and, as noted above, was also the direct incentive that led to the establishment of schools of pharmacy.

From a modern point of view it might be asserted that at least some of the practices of Benjamin Franklin were not to be condoned. You are undoubtedly aware of the fact that Franklin was probably the originator of the modern type of department store; certain it is that he was one of the first to give publicity to the wares he chanced to have on hand and that these commodities varied from needles and pins to horses and slaves.

Not the least remunerative among this varied stock of merchandise were tea, coffee, spices, patent medicines and household remedies.

In looking over the advertisements in the earlier numbers of Franklin's Gazette, or more properly, *The Pennsylvania Gazette*, we find that he offered for sale: "Choice Bohea Tea, Very Good Coffee, Very Good Chocolate, Fine Palm Oil, Very Good English Saffron, Very Good Spermacety, Crown Soap, The True and Genuine Godfrey's Cordial, and Senaka Rattle Snake Root, with directions how to use it in the Pleurisy."

This latter advertisement is particularly interesting as it illustrates the interest manifested by Franklin to introduce and to advocate the use of indigenous remedies.

That Franklin himself aspired to some knowledge of the art of medicine appears from many of his letters, and it is not at all improbable that he, from time to time, recommended sundry remedies to his associates and friends and thus became guilty of what would now be considered "counter prescribing."

Franklin was, however, more than a mere dealer in drugs and medicines, he was a staunch and a very ardent advocate of hygienic measures of all kinds and in this one respect, at least, was very far in advance of his times. He constantly and persistently advocated cleanliness, sobriety and fresh air, and many are the tales told by himself and others about unexpected experiences and marked differences of opinion. Franklin's advice to insist on a constant supply of fresh air in your bed chamber is said to have been accompanied by the assurance that "no outward air that can come in to you is so unwholesome as the unchanged air, so often breathed, of a close chamber."

Franklin was also very fond of water ; he himself tells us how, as a journeyman printer in London, he attracted considerable attention by his skill as a swimmer, and how later in life he was able to cure himself of a cutaneous trouble by repeated bathing. In later years, he is said to have derived great benefit from the use of hot or warm baths which he took in a specially constructed bath tub or bathing machine.

Benjamin Franklin's connection with the then newly introduced practice of inoculating for smallpox is another instance of his far-sightedness, and one for which he should be duly credited.

We of the present day cannot appreciate the havoc and consternation that was wrought by this dread disease two centuries or more ago.

The American colonies appear to have been particularly susceptible to periodic visitations of malignant smallpox, and historians tell us that not alone did the disease spread with alarming rapidity, but that the accompanying mortality, in nearly all of the recorded epidemics, was extremely high.

Dr. Zabdiel Boylston, a noted practitioner of Boston, introduced the practice of inoculation into that city as early as 1721. In this he met with considerable opposition by all classes of people, and the practice itself spread so slowly that for nearly a decade it appears to have been confined to Boston and its immediate vicinity.

In 1730 smallpox was epidemic in Philadelphia, and at least several of the physicians of that city decided to try the practice of inoculation. The interest that Franklin took in this practice is evidenced by the tone of the following clipping from *The Pennsylvania Gazette* of March 4, 1730.

"The practice of inoculation for the smallpox begins to grow among us; J. Growden, Esq., the first patient of note, is now upon recovery, having had none but the most favorable symptoms during the whole course of his distemper, which is mentioned to show how groundless all of those reports are that have been spread through the Province to the contrary."

Quite a number of other notices of similar tone are to be found in the *Pennsylvania Gazette* during the years that it was published by Franklin, and it is evident everywhere that Franklin took an active part in the popularization and spread of the practice.

In 1759, while in England, Franklin wrote, for Dr. William Heberdeen, an account of the practice of inoculation for the small-

pox as practiced in Boston about 1753 or 54. In this account he mentions the great disparity in the mortality of those who took the smallpox in the common way and those who received the distemper by inoculation, despite the fact that the deaths of those inoculated had been distinctly more numerous in proportion at this time than had formerly been observed.

The practice of inoculation served to prepare the way for Jenner's discovery of the relationship existing between cowpox and smallpox and the accompanying practice of vaccination which has so effectually reduced the frequency as well as the dread of this one-time fearful scourge.

One other contribution of Franklin to the science of medicine should be mentioned in this connection. This is the part he took, as a member of the Royal Commission appointed by the King of France, in 1784, to inquire into and report on the claims of Mesmer and his practice of Animal Magnetism.

This commission consisted of four of the leading physicians of the faculty of Paris, and five members of the Royal Academy, of which Benjamin Franklin was the first to be appointed.

Mesmer had come to Paris from Vienna, in 1778, and soon acquired considerable popularity. The resulting frenzy and abuses finally became so serious that the Government was virtually compelled to interfere and the above-mentioned Royal Commission was instituted. The report that was subsequently issued by the Government appears to have been a humorous one, but nevertheless served to give the peculiar conglomerate of fraud and folly such a destructive blow that during the lifetime of Mesmer, at least, it was not heard of to any material extent.

Altogether it may be said of Benjamin Franklin that in matters medical, as in matters political or scientific, he was, as a rule, far ahead of his contemporaries, either as the originator of ideas and innovations, the disseminator of useful knowledge, or the promoter and the champion of practices and teachings which his foresight and experience had taught him to be useful and beneficial.

In conclusion it is probably not too presumptuous to assert that with the passing years Franklin's true merit and worth will be more duly appreciated, even in America, and he will eventually be given the credit of being, as he really was, one of the foremost men of his age.



## IS THE USE OF FOOD PRESERVATIVES JUSTIFIABLE?

BY HORATIO C. WOOD, JR.,

Demonstrator of Pharmacodynamics, University of Pennsylvania.

There are two sides to most questions, and before we make a judgment in the case of "The People versus the Food-Preservatives" we should hear the side of the defendant. Under the conditions of modern civilization it is frequently necessary to transport perishable food long distances between the farmer and the city consumer, and it is urged that the use of antiseptics makes it possible to accomplish this without the food undergoing such putrefactive changes as would render it unfit for nutriment. There can be no doubt, of course, that decayed food is unwholesome and any means of preventing decomposition which is not of itself deleterious to the health is certainly to be most eagerly welcomed by every one; but when an extraneous substance is added to a food-stuff the burden of proof as to its innocuousness rests on the innovator.

Leaving aside for the moment, however, the question of the possible harmfulness of antiseptics, there is one point to which I wish to call attention, and that is the illogical position which is taken by the advocates of food-preservatives, who are mostly persons financially interested in their use. If the users of these embalming fluids are so firmly convinced, as they claim to be, that more wholesome food can be furnished by the use of disinfectants, why are they so actively opposed to letting the world know that they employ them? If I make a pair of shoes in which a new process of tanning is employed that I am convinced gives a better grade of leather than any other process, I certainly should not attempt to hide the fact of this innovation but should lay stress upon it as a recommendation of my wares. Whenever we see a business making vigorous efforts to prevent publicity of its methods the words of the great Teacher are bound to come to our minds, that "men love darkness rather than light because their deeds are evil." There is to my mind no more convincing argument against the use of food-preservatives than the opposition of their advocates to such a legislative measure as the Heyburn Bill, now before the United States Congress.

The statement has been made and repeated that it is impossible to produce wholesomely pure food without the use of antiseptics; but this is mere buncombe. The housewife does not require a bac-

teriologist to prove to her that fruit thoroughly cooked and hermetically sealed will keep indefinitely. Perhaps the most perishable food used in large quantities is milk, and yet it is a fact to-day that in such a large centre of population as Philadelphia, purer milk can be bought than our fathers drank on the farm. Of course it costs to transport milk the necessary distance and have it arrive in good condition without the use of preservatives; but this is beside the question, for the philanthropists who advocate the use of food-preservatives lay no stress upon the money which they save, but talk only of the benefit to the national health.

A recent writer in defending the use of preservatives draws a vivid picture of the disaster to health from eating meat that because of the lack of pickle has reached the market in a most advanced stage of decomposition yet outwardly retaining sufficient appearance of wholesomeness to be salable. This dramatic conception, painted sufficiently lurid to spoil our appetite for all unadulterated pabulum, fades into insignificance, however, in comparison with the facts proven by C. D. Harrington, of Boston, who has shown that by the use of sodium sulphite, meat containing five billion bacteria per gramme could be made to look like fresh meat and the odor of decomposition so covered up that an ordinary customer might be induced to buy this putrid mixture of rotten flesh and sodium sulphite under the delusion that he was purchasing food.

Personally I am not certain of the advisability of legislation at the present time prohibiting the use of all food-preservatives, but I most emphatically do believe that those manufacturers or dealers who use food-preservatives should be made to say so. If I am going to take a daily dose of borax, or of sodium sulphite, or of formaldehyde, I want to know it, and I believe I have a right to know it. If the user of food-preservatives is convinced that my system needs borax or formaldehyde let him show me in what way they will benefit and then tell me the amount that his preparations contain, and perhaps I will eat them. If borax and salicylic acid have a wholesome effect upon the economy let the people but know when they are using these antiseptics and they will soon discover for themselves their beneficent properties.

But I believe there is little room for doubt but that the continued reveling in chemical fare exercises a baneful effect upon the body. Certain it is these disinfectants are not proven harmless. But be

they beneficial, or be they harmful, I maintain that the customer has a right to know whether or not he is eating antiseptics, and I believe that any dealer who sells as a pure food one which contains a preservative is as dishonest as he who sells the gold brick to an innocent hayseed.

There is, however, another and more profound question involved and that is the responsibility of the Government for the health of the people. Our legislators at least make a pretense of protecting us against those who would take our lives or our money, why should they not equally protect us against those who would rob us of health? It is not enough to force dealers to truthfully label their food products, for the great mass of the people are not capable of making a judgment as to the danger of adulterated foods. It would be equally as sensible for the State to hold a pharmaceutical examination and then say, "Anybody may practice pharmacy who wishes to, but we will tell you who has passed our examination." It is clearly the duty of our legislators to decide as to the permissibility of chemical preservatives, and if they show a disinclination so to do it is clearly incumbent on us to see that our law-makers perform their duty.

In closing I wish to plead for an active interest in the Heyburn Pure Food Bill now before the United States Congress. To pharmacists and physicians this measure is of especial interest because it provides not only for the purity of foods but also of drugs. The duty of furthering the passage of this bill devolves to a large extent on these two professions, and while it may not be all that could be desired it is certainly a step in the right direction and it behooves us therefore individually and collectively to do all that we can for its passage.

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### LONDON BOTANIC GARDENS.

BY PIERRE ÉLIE FÉLIX PERRÉDÈS, B.Sc., F.L.S.,  
Pharmaceutical Chemist.

A Contribution from the Wellcome Research Laboratories, London.

(Continued from p. 183.)

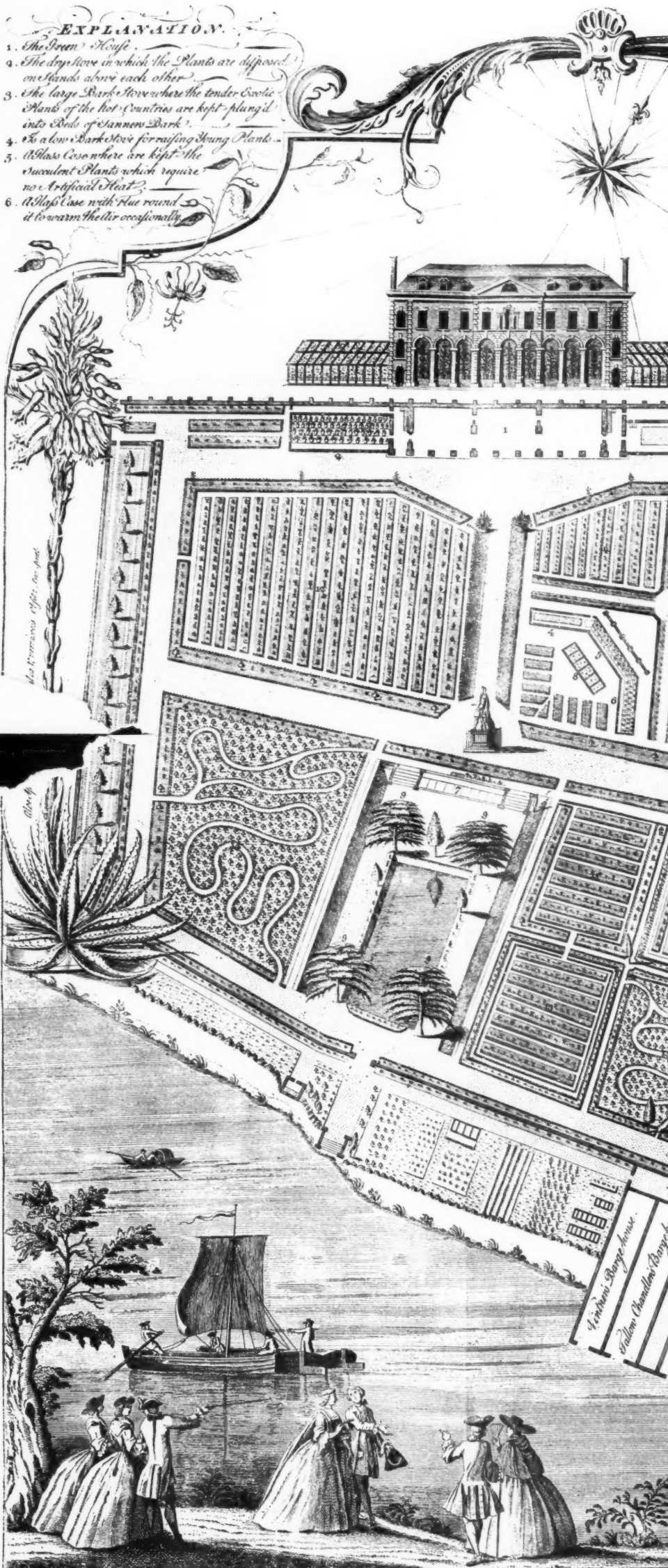
Through Philip Miller's exertions the garden continued to prosper, and we learn from a committee report of 1750 that it had been carefully examined in that year by the members of the com-





# EXPLANATION.

1. The Green House.
2. The step-stove in which the Plants are disposed on stands above each other.
3. The large Bark-stove where the tender Exotic Plants of the hot Countries are kept plunged into Beds of Stannous Bark.
4. To a low Bark-stove for raising Young Plants.
5. A Glass Case where are kept the succulent Plants which require no Artificial Heat.
6. A Glass Case with Fire round it to warm the Air occasionally.



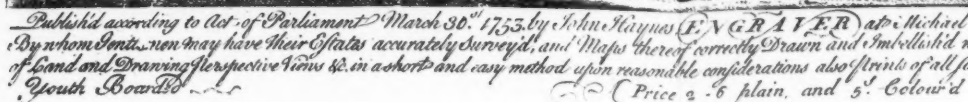
Published according to Act of Parliament March 30<sup>th</sup> 1753. by John Rybus ENGRAVER at Michael  
By whom Persons may have their Estates accurately Surveyed, and Maps thereof correctly Drawn and Embellish'd  
of Land and Drawing Perspective Views &c. in a short and easy method upon reasonable considerations also Prints of all  
Youth Boards (Price 2<sup>d</sup> 6 plain, and 3<sup>d</sup> Colours)





Also Michael Angelo's Head in Buckingham Court near Charing-Cross. — **LONDON**  
and Embellish'd with Perspective Views of their Seats in a Picturesque manner. Likewise may be taught Surveying  
of Struts of all sorts Coloured in Water Colours — Geometry, Architecture, and Geography, Carefully Taught, and  
5<sup>th</sup> Coloured )

1. *The Green House.*
2. *The dry Store in which the Plants are disposed on Shelves above each other.*
3. *The large Dark Store where the tender Exotic Plants of the hot Countries are kept - plant'd into Beds of Sпанnew Bark.*
4. *A low Dark Store for raising Young Plants.*
5. *A Glass Case where are kept the succulent Plants which require no Artificial Heat.*
6. *A Glass Case with Rue round it to warm the Air occasionally.*





And at Michael Angelo's Head in Buckingham Court near Charing Cross. **LONDON**  
and embellish'd with Perspective Views of their seas in a Picturesque manner. Likewise may be taught Surveying  
of Stricks of all sorts Coloured in Water Colours. Geometry, Architecture, and Geography, Carefully Taught, and  
5<sup>th</sup> Coloured ) 22





mittee and found to be in very good order. The expenses of the garden, however, were also increasing, and the strain upon the Society's resources became so great that the Master and Wardens in 1753, the year of Sir Hans Sloane's death, consulted the President of the Royal Society on the subject, but apparently without result. The difficulty was, nevertheless, tided over, and, after 1770, the expenditure continued to advance steadily. During Lindley's tenure of office as Professor and Director it became more than doubled, and ultimately proved too great a burden for the Society to bear. In 1853 economies were effected which will be considered presently, and, in 1860, the Royal Society and the Royal College of Physicians were both approached by the Society of Apothecaries with a view of surrendering the 'garden to one of them. The offer was refused by these bodies, and it was not until 1898 that the Society was able to free itself from the garden and to pass it over to other hands.

The following is an epitome of the principal improvements carried out in the garden during the period which we have just considered: In 1771 the garden was embanked on the river side to reclaim ground that had been encroached upon, and in the following year a rockery was constructed from materials presented by Stanesby Alchorne, John Chandler and Sir Joseph Banks. In 1787 a quantity of loam was brought from Sion and "black mould" from Wimbledon, and shortly after the appointment of William Anderson in 1814 it is once more on record that the garden was in excellent order. This satisfactory condition of things appears to have occurred periodically with the advent of a young and energetic gardener, and to have waned with the advancing age of the latter. We accordingly find that when Lindley became Director of the Garden he reported it to be in a very unsatisfactory condition, and it was only by bringing considerable pressure to bear on Anderson that comparative order was restored. During Robert Fortune's short tenure of office as gardener (1846-1848) improvements were energetically prosecuted, and this policy was continued by his successor, Thomas Moore, until 1853; but between the latter date and 1862 the garden went from bad to worse, owing to insufficient funds. A slight revival took place in 1863, but the garden was in a moribund condition, and after Thomas Moore's death there is nothing of importance to record until its transfer to other hands. In 1870 the construction of the Chelsea embankment was contemplated by the Metropolitan



Board of Works. By mutual agreement between the Board and the Society, the latter lost the foreshore of the garden as well as access to the river, but obtained certain benefits in return, including the present wall, railing, and main gates which face the embankment. Turning now to the particulars of the plant houses and other buildings, we find that the greenhouse, erected in 1732-34, was in 1747 already in need of repairs, and with the assistance of a contribution from Sir Hans Sloane these were duly carried out. In 1779 a new small stove was built to take the place of an old one, and we learn that in 1785 the greenhouse required *slating*, as well as other repairs to *glass lights*. The expenses involved in this work were defrayed by subscription among the constituents of the Society. Two new stoves were erected in 1789, a new tan-pit in 1790, another in 1791, and a new dry stove in 1792, to take the place of a ruined one. Several alterations were begun in 1815 and completed in the following year. These included improved heating arrangements, which involved the addition of a room behind one of the greenhouses to provide sleeping accommodation for the gardeners, in order that the latter might be near the fires. A pump for Thames water was also provided in the same year, as the spring water which had hitherto been used was said to be injurious to the plants. The improvements carried out during Fortune's curatorship comprised "two new span-roofed glass structures, a stove and a greenhouse." In these the "Polmaise" or hot-air system was tried, but found unsatisfactory, and two years later heating by hot water was substituted in its stead. The expense was met, as usual, by subscription among the members and by a grant from the Corporation. In 1853 one of the glass houses was taken down and sold, but one stove was retained, for although it had been proposed to suppress artificial heat altogether in the houses, it was found that some "medicinal plants which were absolutely necessary required heat."<sup>1</sup> In 1863 the plant-houses were re-arranged and new ones constructed, and into some of these Wardian cases were introduced. It was not until the new *régime*, however, that the hothouse collections became at all considerable in extent.

The only other buildings of sufficient importance to be considered here are those which served as a residence for the gardener or cura-

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<sup>1</sup> Cf. Barrett's "History of the Society of Apothecaries," from which the above statement is quoted.

tor. Apartments in the greenhouse were provided for the gardener almost from the first. In 1761, however, Philip Miller made the request that he should be provided with a dwelling in the garden, so that the rooms in the greenhouse were evidently no longer habitable, and it is not until the appointment of William Forsyth as gardener in 1770 that we hear of "lodging-rooms in the greenhouse" being provided once more. John Fairbairn, on his election to the office of gardener, in 1784, was directed "to make the apartments over the greenhouse his residence," and his successor, William Anderson, was granted "the usual apartments for his residence." The construction of a sewer in 1853 rendered the building unsafe, and a new house for the curator was erected on the site of "the old lecture-room."<sup>1</sup> This new building remained until the surrender of the garden by the Society of Apothecaries.

It will not be without interest at this point to refer briefly to the barges and barge-house which figured prominently in the early history of the garden, although the matter is of no botanical interest. Three barges were successively owned by the Society. The first was built in 1675, the second in 1727 and the third in 1764. This last was sold in 1817. Between 1717 and 1727 the apothecaries were without a barge, and they accordingly "entered into treaty with the Stationers' Company for their barge-house at Chelsea."<sup>2</sup> In 1818 the barge-house "was let on lease to Mr. Lyall, of the Swan Brew-house, for twenty-one years," and after his tenancy no more is heard of it.

The steps taken to form a library and herbarium in connection with the garden may also be conveniently considered here. The first indication of the Society's intention to form a library for the

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<sup>1</sup> This formed part of the same building as the old greenhouse and residence of the curator, the whole constituting the "Green House" erected in 1732-4, and indicated in Plate XXV by figure "1." The building is also seen in the distance through the gateway in Plate XXIII.

<sup>2</sup> The references to this barge-house in Henry Field's "Memoirs" and in Mr. Barrett's work are very confusing. It is certain, however, that more than one barge-house was owned by the Society, inasmuch as two barge-houses, in addition to the one which the Society itself occupied, are mentioned in the Society's records, and details are given in latter of various agreements relating to the tenancy of the houses by the Tallowchandlers', Weavers', Coopers', Vintners' and Goldsmiths' companies. The existence of these three barge-houses is further confirmed by the old print reproduced on Plate XXV.

garden is found in one of the Society's minute books under the date of October 6, 1681, where it is recorded that it was then determined to "contrive a library" for the use of the laboratory and garden.

Samuel Dale, a member of the Society,<sup>1</sup> who died in 1739, left a legacy of books and dried plants to the Society on condition that the Master and Wardens should, within twelve months after his decease, "make or erect proper conveniences in their Physick Garden at Chelsea, for the reception thereof." Presses were accordingly made for their accommodation, and an inscription was placed over the collection to indicate that it was the gift of Dr. Dale.<sup>2</sup> The collection of books in the Chelsea Garden was increased in 1744 by the addition of a number of botanical works, the gift of the executrix of Isaac Rand. From a catalogue prepared by Stanesby Alchorne in 1769, it appears that there were in that year at the garden 266 books, mostly on botanical subjects, and about 50 unbound books and pamphlets. According to this same catalogue, there were also 238 volumes in the older library at the Apothecaries' Hall, but many of these had originally formed part of the garden library, and had been removed to the hall on various occasions. This process seems to have continued until the whole of the collection of books at the garden became absorbed by the Hall Library, for it was found necessary in 1863 to furnish "the rooms of the assistant gardeners with suitable books and specimens for the instruction of these officials."

<sup>1</sup> This is on Field's authority, but Prof. G. S. Boulger, in an able account of Dale contributed to *The Journal of Botany*, Vol. XXI (1883), pp. 193-197 and 225-231, has shown that the statement is probably incorrect. Professor Boulger says: "He was apprenticed on the 5th of May, 1674, as the 'son of North : Dale of ye parish of St. Mary Whitechappell in County Middlsx. silk-thrower . . . to Thos. Wells for 8 yeares ;' but as he seems never to have practised as an apothecary in London it was not necessary for him to take out his freedom as a member of the Society of Apothecaries, and he seems never to have done so."

<sup>2</sup> "In the *Gentleman's Magazine* he is described at his death as Dr. Samuel Dale, F.R.S. ; and many notices of him speak of his being a Licentiate of the Royal College of Physicians. He, however, seems never to have received or used the title of M.D. ; his name does not occur in Dr. Thomson's list of the Fellows of the Royal Society, nor in that by Dr. Munk of the Licentiates of the College of Physicians. There is, in fact, no reason to suppose that either of these three titles has been rightly applied to him."—Boulger, *loc. cit.*, p. 229.

Dale's herbarium was supplemented in 1745 by a donation of 12 volumes of dried plants from Robert Nicholls. These were deposited in the greenhouse, and, in 1748, 22 similar volumes were presented to the Society by Joseph Miller's widow. Isaac Rand's herbarium was also bequeathed to the Society, and in 1759 Mrs. Rand gave a sum of £100 to be held in trust for its repair. That is to say, two-thirds of the annual interest was to be paid to the Demonstrator for the time being "for placing twenty newly dried specimens of plants yearly, in her late husband's collection, in room of such as might be decayed," while the remaining third of the interest was allotted "to the Master and Wardens for seeing it done." In Stanesby Alchorne's catalogue of 1769 the *Hortus Siccus* of Joseph Miller was stated to consist of 20 volumes. A "bundle of dried plants," the gift of John Wilmer, is also mentioned in this catalogue, but there is no reference in the latter to Isaac Rand's collection. William Hudson bequeathed his herbarium to the Apothecaries' Society at his death in 1793. In 1806 this collection was presented to Thomas Wheeler, who was then Demonstrator of Plants, and, finally, in 1862, the whole of the herbarium specimens at the Chelsea Garden was presented to the trustees of the British Museum. The most important of these collections is undoubtedly that of Samuel Dale, owing to the fact that it contains the original herbarium of John Ray, who had bequeathed it to his friend Dale.

Having now considered the main features of interest in the *matériel* of the garden under the Society's rule we may conclude this first section by amplifying our account of the administration of the garden during that period.

It has already been stated that when the Society of Apothecaries came into complete possession of the garden in 1722, a special committee was appointed to administer the latter. This committee originally consisted of the Master, the two Wardens and nine other members of the Court of Assistants. The same constitution as to number of members obtained until 1776, but in 1752 three of the members were ordered to be changed every year. In 1776 the Court of Assistants directed that every member of that court who had served the office of master should be a standing member of the Garden Committee. The number of members on this committee was further increased in 1784 by the addition of three members of the Livery, and this appears to have been the last change made in the

constitution of the Garden Committee. The services of the members of the committee were, so far as can be ascertained, gratuitously rendered at first, but in 1776 it was directed that each member should be allowed five shillings for every attendance. Refreshments were also provided at the Society's expense, and, in 1780, the sum of £5 was fixed as the allowance for refreshments at each meeting. In 1810 the regular meetings were ordered to be held in April, June, August and September, and the "refreshments" at the meetings eventually took the form of dinners held in the garden. In 1853 both the fees and the dinners were abolished, and even the Garden Committee itself ceased to exercise its functions for a time. Indeed, although the Garden Committee is said to have resumed its proceedings after a short interval, there is little evidence to show that it was in existence until 1862 when it was galvanized into a semblance of life, chiefly through the efforts of Nathaniel Bagshaw Ward. After Ward's death in 1868 we again look in vain for evidence of life in the Garden Committee, and most of the administrative work appears to have been undertaken by the Court of Assistants.

The rules framed by the governing body for observance by the Demonstrator of Plants and *Præfectus Horti* are among its most important enactments, and we will now proceed to consider them. The duties of the office of Demonstrator of Plants had, as we have seen, been defined in general terms on the appointment of Isaac Rand to that office in 1724, but it was not until 1773, when William Curtis was elected to the post, that these duties were set forth in detail. This set of instructions has already been referred to elsewhere, and several of its clauses have been dealt with in detail. The terms of the remainder still remain to be considered, and were as follows:—

"The office of Botanical Demonstrator to this Society, is to superintend their garden and gardener, as also their library, and all other matters upon their premises at Chelsea; but with submission always to the superior direction of the General Committee for the management of the Society's Garden. His duty is to encourage and cultivate the knowledge of Botany, theoretic as well as practical, among the students of this Society; for which purpose,

"—— He is to attend the Society's Garden at stated times, not less than once in every summer month, (from April to September, both inclusive) to demonstrate the plants, especially in the official



quarter, with their names and uses. The last Wednesday in each of the above months has been usually appropriated to this service, beginning at nine of the clock in the morning.

"—— He is yearly to prepare fifty dried specimens from plants, growing in the Society's garden at Chelsea, which are to be presented to the Royal Society, by direction of the late Sir Hans Sloane, Bart. having been first approved by the Court of Assistants of this Society. Also to dry twenty other specimens, in lieu of so many plants which shall be found decayed in the collection of the late Mr. Rand, now in the library at Chelsea. These to be placed in the said Herbarium before the first day of May in every year, and there will be fifty shillings paid him for every such service, by appointment in the will of the late Mrs. Rand."

The rules of 1773, with the exception of the last-mentioned paragraph, do not seem to have undergone any alteration until the election of James Lowe Wheeler as Demonstrator and *Præfectus* in 1821, when some slight amplifications were introduced. The Demonstrator was required, as in the minute of 1773, to give demonstrations in the garden on the last Wednesday of each summer month, but it was further stipulated that he should on each such occasion, or on other occasions if so directed, employ some time "in explaining to the students the systems of Botany, both Sexual and Natural, as taught by Linnæus and Jussieu; together with the principles of vegetable life, and the Structure, Physiology, and Medical Virtues of Plants, their Natural Climate, the alterations produced by culture, and the parts of them employed whether medicinally or as food for man and other animals." With the exception of a few other suggestions, however, the new instructions were substantially the same as the old ones. But a new order of things was being created by the Act of 1815, in that membership was not incumbent upon the new licentiates of the Society, and these unaffiliated licentiates, as well as students preparing themselves for the license, were rapidly increasing in numbers. The demonstrations and herborizings, however, were confined to members or their apprentices, so that this growing class of students and qualified non-members was placed at a considerable disadvantage. The advisability of remedying this state of things gradually impressed itself on the members of the Garden Committee, and, in 1829, it was suggested by them that the garden might be made more useful to the profession gen-

erally than it had hitherto been. They recommended that the garden should be opened weekly on Fridays between 9 and 11 in the morning, dating from the third of July of that year, "to all such Medical Students as were pupils to the established Professors and Tutors in the Metropolis in Medicine, Chemistry, *Materia Medica*, or Botany." This was accordingly done, and a ticket of admission was issued to every metropolitan medical student who brought a letter of recommendation from his teacher. More than 100 pupils having taken advantage of the facilities offered to them by the Society, the Garden Committee in December of the same year presented a further report to the "Master, Wardens, and Assistants of the Society of Apothecaries" embodying the following recommendations:—

"That the Garden be open every Wednesday during the months of May, June, July, August, and September, from 9 o'clock in the morning until 12 at noon, and that admission be given to all such medical students as are pupils to the established professors and lecturers in the metropolis, whether in Medicine, Chemistry, *Materia Medica*, or Botany, and also to the Apprentices of the several Members of the Society.

"That there be every week a demonstration of all the plants contained in the *Materia Medica* department of the Garden, and of such other plants as the Demonstrator may think proper. Such demonstration to commence at 10 o'clock punctually, and that after such demonstration is finished there be a lecture delivered by the Demonstrator in some part of the building attached to the Garden, upon one or more of the following subjects, so as to form during each summer season a regular Course of Botanic Study, namely,—

"(1) The different systems of Botany, both natural and artificial, particularly those of Linnæus and Jussieu.

"(2) The Structure and Growth of Plants.

"(3) The different parts of Plants, with their description and uses in the process of Vegetation.

"(4) The natural and chemical analysis of vegetable matter.

"(5) The medicinal uses of the most important articles in the *Materia Medica*, with observations on the best modes of preparing them. These remarks may be made either at the lectures or at the demonstrations, at the discretion of the lecturer.

"That the conducting these demonstrations and lectures be committed to the Society's Demonstrator of Botany, and that the monthly lectures hitherto delivered by him at the Garden be discontinued, as merging in and more effectually provided for in the lectures now proposed to be adopted. . . .

"That in consequence of the additional service occasioned by these lectures the salary of the Botanical Demonstrator be increased."

These recommendations were adopted, and the new rules came into operation in the following year. When Lindley became *Præfectus Horti* and Professor of Botany the number of lectures in the garden was increased, a lecture being delivered twice a week at 8.30 A.M. in May, June, and July, instead of one weekly at 10 A.M. from May to September. Other suggestions as to the re-arrangement of the plants and the preparation of a catalogue were also made by Lindley, and these were readily acted upon by the Society. Lindley, in a word, may be said to have dictated terms which were at once acceded to, so that the entire management of the garden was virtually in his hands until the suppression in 1853 of the office of Director of the Garden, which he was the last to hold.

We have seen that the regulations of 1773 had placed the gardener in a subordinate position. This arrangement seems to have worked smoothly on the whole until the advent of Lindley, when submission to the *Præfectus Horti* was enforced on Anderson, who was gardener at the time. After the abolition of the office of *Præfectus Horti*, the gardener, then known as the curator, was entrusted with the management of the garden, subject, of course, to the higher authority of the Society's governing body. The inadequate remuneration of the gardener seems to have been a cause of much complaint on the part of that functionary. In 1767 Philip Miller presented a memorial to the Court of Assistants showing that his expenses in connection with the garden were not covered by his salary, and a gratuity of £50 was accordingly granted to him in the following year. Forsyth, in 1774, also complained that his salary was insufficient, and, in order to supplement this, the vicious principle was introduced of allowing him to sell supernumerary plants for his own profit. Before leaving this topic there are a few other administrative matters connected with the office of gardener which merit some notice. Thus we learn that in 1744 "an order

was made that no person be permitted to gather specimens from the garden without leave from the director or gardener, and that no person whatever, who was not a member of the Society, be permitted to walk in the garden without the attendance of the gardener." It is apparent from this that the public had been admitted to the garden, and there is also evidence to show that the precautions just mentioned were taken because of some act of vandalism by a visitor. By 1786, however, the members had become so numerous that it was a difficult matter for the gardener to recognize them all, so that "an engraved card suitably ornamented, and endorsed by the Master and Wardens for the time being, was directed to be given to every present and future member, to which the gardener and his servants were to pay due regard." The importance of the gardener's services was also recognized by others besides the members of the Society of Apothecaries and the general public, for in 1815 the Horticultural Society requested that they might be allowed to make experiments in the Chelsea Garden under the control of the Society of Apothecaries and its gardener. This request was refused, but permission was accorded to the gardener to make such experiments, provided that application was made by the Horticultural Society through the Garden Committee, and a portion of the garden was accordingly set aside for "the planting of various fruit trees and esculent vegetables."

It has already been mentioned that the normal expenses incurred in administering the garden were met, as early as 1713, by the imposition of fines on the Society's constituents. It has also been shown how this arrangement was disturbed in succeeding years owing to the unsettled condition of the garden. After the transfer of the property to the Society of Apothecaries by Sir Hans Sloane the system of levying definite fees upon the Society's members was again introduced, and this, together with additional grants from the Corporation, was the method adopted during the whole period in which the garden was owned by the Society of Apothecaries. It will, further, be remembered that extraordinary expenses were met, in the early days of the garden's history, by subscriptions among the members of the Society, and by special grants from the Corporation. This system was also the one subsequently adopted on similar occasions.

The awarding of prizes for proficiency in botanical subjects is

intimately connected with the administration of the garden, and a short account of the steps taken by the Society in this direction will form a fitting prelude to the next section of our subject, namely, the Botanical work accomplished in the garden. Prizes in Botany were offered by the Society to their apprentices at least as early as 1789, but it was not until 1830 that the scope of the examinations in Botany and *Materia Medica* was extended so as to include external students. The recommendations of the Garden Committee adopted in 1829 have already been considered in some detail in connection with the duties of the Demonstrator of Plants. The following clauses relating to the examination of candidates and to the awarding of prizes complete the main provisions of the report in question:

"That in order to give encouragement to diligence and talent, there be an annual examination of such students as may think proper to become candidates for the prizes intended to be given on these occasions. The examinations to be upon some or all of the subjects stated in the foregoing series of lectures (see pp. 232, 233), as well as upon their skill in the nomenclature of plants. No person to be admitted a candidate who has not attended these lectures and demonstrations at least eighteen days in one summer, or thirty days in two succeeding summers, nor shall any prize be awarded unless his examination be performed to the complete satisfaction of the examiner or examiners for the time being.

"To prevent partiality or undue preference, no public professor or lecturer whose pupils are admitted to the Garden can be appointed an examiner.

"The apprentices to Members of the Society having an annual opportunity of being candidates for prizes upon the ancient establishment, cannot be admitted candidates on these occasions either during the period of their apprenticeship, or subsequently to the conclusion of it.

"That two medals, the one being of gold of ten guineas value, and the other of silver or bronze, be annually awarded to the two candidates who shall have passed the best and second best examination in manner hereinbefore mentioned, but no medal to be given unless in the opinion of the examiner or examiners the candidate shall be deemed deserving of it."

The recommendations were adopted, and, in conformity with



them, three prizes were awarded at the termination of the session in 1830; two to medical students at large, and one to the apprentices of the Society. The two examinations for these classes of students were fused into one in 1837, and a modification in the prize-awards was introduced at the same time: the best candidate was to receive a gold medal, the second a silver medal with books, and the third books only. In 1853 these prizes were discontinued, but renewed after a short interval. James Lowe Wheeler, David Don, Nathaniel Bagshaw Ward, Sir J. D. Hooker, and the Rev. Miles Berkeley successively held the post of examiner for prizes in Botany, while the following well-known names may be selected from the roll of successful candidates: Thomas Henry Huxley, Maxwell Tylden Masters, John Harley, Charles Hilton Fagge, Henry Trimen, and Henry Charlton Bastian.

[*To be continued.*]

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## THE INTERDEPENDENCE OF MEDICINE AND PHARMACY.<sup>1</sup>

BY AUGUSTUS A. ESHNER, M.D.

The province of the physician is the alleviation of suffering and so far as possible the prevention and cure of disease. In the fulfilment of these functions he has at his command divers agencies, some of a medicinal, others of a non-medicinal character. Of certain of these he can exercise entire control. In the application of others he requires the aid of experts in other departments of science and art. For purposes of diagnosis, for example, he must have instruments of precision, such as the microscope, apparatus for blood-counting, hemoglobin estimation, study of blood-pressure, urea estimation and the like. In treatment he may avail himself of various physical agencies, such as light and heat, water, air, electricity, manual procedures and mechanical appliances. Some of these he may himself devise and apply. For others he depends upon workers in other spheres of activity. So also with regard to the articles of the *materia medica*. The primitive physician was himself able to gather the simple herbs needed in the preparation of the infusions and de-

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<sup>1</sup> Read before the Philadelphia Branch of the American Pharmaceutical Association, March 28, 1906.

coctions through whose aid he sought to bring relief. With the evolution of medicine and the gradual increase in the number and complexity of medicinal agents the practitioner of medicine has become dependent upon the pharmacist. On the former reposes the obligation of familiarizing himself with disease for the purpose of its recognition and appropriate treatment, while upon the latter devolves the duty of preparing and providing in most convenient, most palatable and most reliable form the drugs prescribed by the physician. The physician should know more or less intimately the sources of the preparations he uses and their general chemical composition, but he cannot be expected to be able to construct them for himself. The pharmacist, however, must be master of all these things, but he is exempt from the obligation of directing the employment of the remedies; it is his function to prepare. The duty of diagnosis and treatment belongs to the sphere of the physician, that of drug preparation and dispensing to the sphere of the pharmacist. Physician and pharmacist are thus mutually dependent on each other, and a spirit of friendly and helpful co-operation must subsist between them for the attainment of the fullest measure of success in the direction of the end in view that both have in common—namely, the healing of the sick.

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### BOOK REVIEWS.

THE MICROSCOPY OF VEGETABLE FOODS with special reference to the detection of adulterations and the diagnosis of mixtures. By Andrew L. Winton, Connecticut Agricultural Experiment Station, and Josef Moeller, University of Graz. Large 8vo, xvi + 701 pages, 589 figures. Cloth, \$7.50. New York: John Wiley & Sons. London: Chapman & Hall, Ltd.

Both Doctors Winton and Moeller are well known for their valuable researches in the study of food products. Dr. Winton is a former student of the eminent pharmacognosist, Professor Moeller. It is rather unique to find a student associated with his teacher, each contributing his part to a common work, and the whole appearing almost simultaneously in two languages. In the American edition it is Dr. Winton with the collaboration of Professor Moeller. In the German edition it is Professor Moeller with the collaboration of Dr.

Winton. It is a beautiful acknowledgment of their confidence in each other and we have seldom seen the work of two men that is so much alike, in both drawings and descriptions, as in this instance.

The work is divided into ten parts, as follows: (1) Equipment, methods and general principles; (2) grain, its products and impurities; (3) oil seeds and oil cakes; (4) legumes; (5) nuts; (6) fruit and fruit products; (7) vegetables; (8) alkaloidal products and their substitutes; (9) spices and condiments; (10) commercial starches. There is in addition a general bibliography, a useful glossary, and a good index.

The microscopical characteristics of not less than 300 different substances are considered. The illustrations number nearly 600 and are very well done. It is the most elaborate book of the kind which has thus far appeared in the English language and is to be recommended for its completeness and accuracy.

**ELEMENTS OF APPLIED MICROSCOPY**, a text-book for beginners. By Charles Edward Amory Winslow, Massachusetts Institute of Technology. 12mo, xii + 183 pages, 60 figures. Cloth, \$1.50. New York: John Wiley & Sons. London: Chapman & Hall, Ltd.

This is an excellent little book, and while the author modestly states that "it contains very few original data and treats no single subject with completeness," it has required a large amount of work on his part to get the material together. The following subjects are discussed: I. Function and Parts of the Microscope. II. Manipulation of the Microscope. III. The Mounting and Preparation of Objects for the Microscope. IV. Micrometry, and the Camera Lucida. V. The Microscopy of the Common Starches. VI. Foods and Drugs and their Adulterants. VII. The Examination of Textile Fibres. VIII. The Microscopy of Paper. IX. The Microscope in Medicine and Sanitation. X. Forensic Microscopy. XI. Microchemistry. XII. Petrography and Metallography.

A course, such as is indicated in this book, would be found very useful to the analyst, and we wonder that work of this kind has not been made an essential part of the training of chemists.

**METHODS OF ORGANIC ANALYSIS.** By Henry C. Sherman, Columbia University. New York: The Macmillan Company, 66 Fifth Avenue. \$1.75.

This is an excellent book treating of the quantitative analysis of

food materials and related substances. Methods for the determination of the following substances are given: Nitrogen; sulphur; phosphorus; alcohols; aldehydes; carbohydrates; acids; oils, fats and waxes; fatty oils; butter; soaps and lubricants; proteids and cereals; milk. Each of these subjects is treated with considerable detail in reference to both analytical methods and the interpretation of results. As a rule, foot-notes show the original sources of statements or methods included in the text, while general or additional references are given at the end of each chapter. The references have been carefully selected and place the reader in touch with the most important literature. In addition the book contains a large amount of valuable information in the form of tables, as on the analytical properties of typical oils, fats and waxes, etc.

GRUNDZUGE DER CHEMISCHEN PFLANZENUNTERSUCHUNG. Von L. Rosenthaler, University of Strassburg. Berlin: Verlag von Julius Springer. M. 2.40.

Rosenthaler's little book of 124 pages contains methods for the quantitative determination of the following plant substances: Alkaloids; glucosides; fats and fatty oils; waxes; lecithin; ethereal oils; resins; tannin; phlobaphene; organic acids; proteids; decomposition products of proteids; enzymes; toxalbumins; carbohydrates and related substances; inorganic substances, etc. There are numerous references to the literature and a good index. The book contains modern methods and will be found very useful to analysts.

QUIZ-COMPENDS.

ESSENTIALS OF MATERIA MEDICA AND THERAPEUTICS. By Henry Morris. Thoroughly revised by W. A. Bastedo. Philadelphia, New York and London: W. B. Saunders & Co.

A COMPEND OF MEDICAL CHEMISTRY, inorganic and organic, including urinary analysis. By Henry Leffmann. Fifth edition. Philadelphia: P. Blakiston's Son & Co.

A COMPEND OF MEDICAL LATIN, designed especially for elementary training of medical students. By W. T. St. Clair. Second edition. Philadelphia: P. Blakiston's Son & Co.

Saunders & Co. advertise in the book by Morris and Bastedo that "since the issue of the first volume of the Saunders Question-Compend, over 250,000 copies of these unrivalled publications have

been sold." Dr. Leffmann is probably the spokesman for the Blakiston compends, for he says in the preface: "It has been said that Alexander Pope is a poet whom everybody quotes and nobody reads. It may be said of compends that they are books that most professors and reviewers condemn and that nearly all students use." The book of St. Clair is more like a small text-book dealing with the application of the Latin language to medical terminology.

If the publishers and authors did not talk so much of the hundreds of thousands of these books that are sold, possibly the teachers and writers of text-books would not so seriously object to them. That these books have been so extensively used in certain quarters is probably in part due to the system of instruction in professional schools, for, as pointed out by Dr. Leffmann, the "students are obliged to meet two distinct requirements. They must study for the knowledge necessary for the practice of the profession and they must study to pass examinations. The latter are in so many cases arbitrary in scope, and affected by the personal equation of the examiner, that the student cannot be blamed for resorting to a concise presentation of the more important facts of the science, supplementing this by notes of the narrower and more strictly personal items of the teaching."

Students may purchase these books, but in the better schools the students do not use them so extensively as is supposed, and it is only a matter of time when the harvest in the sale of these books will be over. Quiz-compendes are essentially publishers' books; men who esteem their reputations should not write them and students who wish to profit by their reading had better leave them alone. Books of quotations and concise facts prepared by others may sometimes be useful, but a scholar can never be made by using such books alone.

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#### THE FRANKLIN BI-CENTENARY 1706-1906.

The two hundredth anniversary of the birth of Benjamin Franklin was celebrated in Philadelphia, April 17th to 20th, 1906. The celebration was under the auspices of the American Philosophical Society held at Philadelphia for Promoting Useful Knowledge. This society was founded by Franklin in 1743, and is the oldest scientific society in America. Prof. Edgar F. Smith, Vice-provost of the



University of Pennsylvania, is the president of the Society, and he, together with the other officers of the Society having the celebration in charge, deserves great credit for the admirable way in which the celebration was planned and carried out. In this connection Dr. I. Minis Hays, senior Secretary of the Society, deserves special mention, not only for having first conceived the idea of holding the celebration, but also because of the great amount of work which he did in arranging for it.

That the celebration was planned on broad lines is shown by the fact that no less than 125 of the oldest and leading learned societies and institutions of learning in all parts of the world were represented by delegates. The delegates numbered about 200 and included members of the Congress of the United States, members of the Legislature of the State of Pennsylvania and members of the Council of the City of Philadelphia. The meeting was therefore national in character, and some of the events connected with it served to make it international in significance and illustrated again the happy thought that the men of science and the men of letters constitute a world democracy. The special features of the programme were the conferring of the honorary degree of Doctor of Laws upon Miss Agnes Irwin, great-great granddaughter of Franklin and dean of Radcliffe College, the Woman's Annex to Harvard University, by Mr. Andrew Carnegie, Lord Rector of St. Andrew's University, Scotland, who stated that this same degree had been conferred by St. Andrew's University on Benjamin Franklin in 1759; the presentation to the American Philosophical Society of two medallions—one of Benjamin Franklin made by his friend and admirer Josiah Wedgewood and one of Erasmus Darwin—by Sir George H. Darwin, great-grandson of Josiah Wedgewood and great-grandson of Erasmus Darwin; the conferring of the honorary degree of Doctor of Laws upon King Edward VII through the British Ambassador to the United States, Sir Henry Mortimer Durand, by the University of Pennsylvania; presentation of the Commemorative Medal to the Republic of France through His Excellency Jules Jusserand, LL.D., Ambassador Extraordinary and Envoy Plenipotentiary, by Hon. Elihu Root, LL.D., Secretary of State, under the direction of the President of the United States; and the exhibition of the Wilson portrait of Benjamin Franklin, which was stolen from his residence in Philadelphia during the Revolution, carried to England and

recently returned to this country from London by Earl Grey, Governor General of Canada, it having hung in Northumberland Castle, the ancestral home of the Greys, for 129 years.

In order to show yet more fully the character of the celebration, the programme is presented in condensed form as follows:—

OPENING SESSION, TUESDAY EVENING, APRIL 17th, AT  
WITHERSPOON HALL.

Address by the President.

Reception of Delegates from learned societies and institutions of learning.

Presentation of addresses by delegates.

THE UNIVERSITY OF ST. ANDREWS.

Conferring of the Honorary Degree of Doctor of Laws by the Lord Rector, Mr. Andrew Carnegie.

Informal reception after adjournment.

MEETING FOR THE READING OF PAPERS ON SUBJECTS OF SCIENCE,  
WEDNESDAY, APRIL 18th, IN THE HALL OF THE SOCIETY.

The Statistical Method in Chemical Geology by Frank Wigglesworth Clarke, Sc.D., of Washington (illustrated by lantern slides).

On a possible Reversal of the Deep Sea Circulation and its Effect on Geological Climates by Prof. Thomas C. Chamberlin, of Chicago.

Elementary Species in Agriculture by Prof. Hugo deVries, of Amsterdam, Holland.

An International Southern Observatory by Prof. Edward C. Pickering, of Cambridge, Mass.

The Figure and Stability of a Liquid Satellite (with lantern slides of diagrams) by Sir George Howard Darwin, K.C.B., F.R.S., of Cambridge, England.

Form Analysis by Prof. Albert A. Michelson, of Chicago.

The Present Position of the Problem concerning the First Principles of Scientific Theory by Prof. Josiah Royce, of Cambridge, Mass.

The Human Harvest by President David Starr Jordan, of Stanford University, Cal.

On Positive and Negative Electrons by Prof. H. A. Lorentz, of Amsterdam.

The Elimination of Velocity-Head in the Measurements of Pressures in a Fluid Stream by Prof. Francis E. Nipher, of St. Louis.

Old Weather Records and Franklin as a Meteorologist by Prof. Cleveland Abbe, of Washington.

Was Lewis Evans or Benjamin Franklin the first to recognize that our Northeast Storms come from the Southwest? by Prof. William Morris Davis, of Cambridge, Mass.

Notes on the Production of Optical Planes of large Dimensions by Dr. John A. Brashear, of Allegheny, Pa.

A new Mountain Observatory by Prof. George E. Hale, Pasadena, Cal.

EVENING SESSION, WEDNESDAY, APRIL 18TH, AT WITHERSPOON HALL.

ADDRESSES.

Franklin's Researches in Electricity by Prof. Edward L. Nichols, Ph.D., of Ithaca.

The Modern Theories of Electricity and their Relation to the Franklinian Theory by Prof. Ernest Rutherford, F.R.S., of Montreal.

THURSDAY, APRIL 19TH, AT THE AMERICAN ACADEMY OF MUSIC,  
AT 11 A.M.

THE UNIVERSITY OF PENNSYLVANIA.

Conferring of honorary degrees.

Oration by the Hon. Hampton L. Carson, Attorney-General of the Commonwealth of Pennsylvania.

AT CHRIST CHURCH BURYING GROUND, 4 P.M.

Ceremonies at the Grave of Franklin, under the auspices of the Grand Lodge of F. & A. M., of Pennsylvania.

RECEPTION AT THE BELLEVUE-STRATFORD, 9 P.M.

FRIDAY, APRIL 20TH, AT THE AMERICAN ACADEMY OF MUSIC, 11 A.M.

ADDRESSES IN COMMEMORATION OF BENJAMIN FRANKLIN

As Citizen and Philanthropist by Horace Howard Furness, Litt. D. (Cantab.).

As Statesman and Diplomatist, by the Hon. Joseph Hodges Choate, LL.D., D.C.L.

As Printer and Philosopher, by President Charles William Eliot, LL.D.

PRESENTATION OF THE FRANKLIN MEDAL TO THE REPUBLIC OF  
FRANCE

(In accordance with the Act of Congress)

By the Honorable Elihu Root, Secretary of State

(By direction of the President)

MEETING FOR THE READING OF PAPERS ON SUBJECTS OF SCIENCE AT  
3 P.M. IN THE HALL OF THE SOCIETY.

Repetition and Variation in Poetic Structure by Prof. Francis Barton Gummere, of Haverford, Pa.

The Herodotean Prototype of Esther and Sheherazade by Prof. Paul Haupt, of Baltimore, Md.

Heredity and Variation, Logical and Biological, by Prof. Wm. Keith Brooks, of Baltimore.

Notes on a Collection of Fossil Mammals from Natal by Prof. William B. Scott, of Princeton.

The Use of Dilute Solutions of Sulphuric Acid as a Fungicide by Prof. Henry Kraemer, of Philadelphia.

Franklin and the Germans by Prof. M.D. Learned, of Philadelphia.

The Use of High Explosive Projectiles by Prof. Charles E. Munroe, of Washington.

Ammoniacal Gas Liquors by Prof. Charles E. Munroe, of Washington.

The Chromosomes in the Spermatogenesis of the Hemiptera Heteroptera by Prof. Thomas H. Montgomery, Jr., of Austin, Texas.

DINNER AT THE BELLEVUE-STRATFORD, 7 P.M.

Toasts were responded to by Senator Lodge, Sir George Howard Darwin, Andrew Carnegie, His Excellency Jules Jusserand, Dr. S. Weir Mitchell, Hon. Elihu Root, and Governor Pennypacker.

In a number of instances the formal addresses sent by the institutions and societies invited to participate in the celebration were richly engrossed and illuminated, and while for the most part the English language was the medium of expression, some of them were in Latin, one in German, one in Dutch and one in Japanese.

The delegates appeared in their academic robes at the opening meeting on Tuesday evening and at the meeting on Friday morning, and this added much to the picturesqueness and splendor of these sessions. Interest in the commemorative session was also heightened by the fact that the Governor of Pennsylvania, as patron of the Society, presided.

It may not be amiss to state that those announced on the programme as presenting papers were present to read them in person with but few exceptions, one of these being President Jordan, of Leland Stanford University, who, in view of the destruction wrought by the recent earthquake in California, had selected for his paper the oddly significant title, "The Human Harvest."

Prof. Ernest Rutherford took his hearers to the outermost bounds of our knowledge of the material world, and said that in our attempt to explain matter we were more nearly in the position of explaining it away. He defined matter as electricity in motion, but said that science could give no adequate answer to the question, "What is electricity?" In commenting on the electrical theories of Franklin he said:

The theory of electricity developed by Franklin, generally known as the 'one-fluid' theory, must be regarded as the greatest of his additions to electrical knowledge, for it has exerted a profound influence on the development of electrical ideas, and, even after the lapse of a century and a half of ceaseless activity in electrical research, still holds its place, though in a modified form, as the generally accepted explanation of the connection between positive and negative electricity.

After a century and a half of great scientific activity, which has added enormously to our knowledge of electricity, the ideas of electricity which are in vogue to-day bear a remarkable resemblance to those advocated by Franklin in the infancy of the subject. This resemblance must have been obvious to you all in the light of the recent developments which have been touched upon in this paper. We believe that there is one kind of electricity, namely, negative electricity, which is carried in small definite units by the electrons. These electrons are a mobile constituent of all matter and are able to move freely through metals.

Altogether it may be said that those in attendance enjoyed a rare intellectual feast, and that the occasion, which witnessed the whole world paying homage to the memory of a man born two hundred years ago, furnished another proof of the saying that no good or great work ever dies.

FLORENCE YAPLE.



## THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The formal meeting for organizing the Philadelphia Branch of the American Pharmaceutical Association was held in the hall of the College of Physicians on the evening of Wednesday, March 28, 1906.

The committee that had been appointed at the preliminary meeting to prepare and to present a set of rules or by-laws for the guidance of the local branch made their report, and this report, after some discussion and a few minor amendments, was adopted as the—

### PREAMBLE AND RULES FOR THE GUIDANCE OF THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

WHEREAS, The advancement of pharmaceutical knowledge and the elevation of the professional character of apothecaries and druggists throughout the United States are objects that are dear to us, in common with all well-disposed pharmacists; and,

WHEREAS, Some of those in whose hands the practice of pharmacy now exists do not manifest the necessary professional spirit, or a proper appreciation for the duties and the responsibilities that are involved;

Therefore, We, the undersigned members of the American Pharmaceutical Association, do hereby resolve to constitute ourselves into a local branch, for the purpose of more actively pursuing and accomplishing the objects for which that association was founded.

The name of this society shall be, "The Philadelphia Branch of the American Pharmaceutical Association."

This branch hereby adopts for its guidance and declares its adherence to the Constitution and By-laws of the American Pharmaceutical Association, and the individual members hereby signify their willingness to live up to and to abide by the precepts and the provisions that are embodied in the constitution now in force.

The active members, in appending their names as members, further signify their willingness to subscribe to and to abide by the Code of Ethics promulgated by the Founders of the American Pharmaceutical Association.

### BY-LAWS.

Members—This branch shall consist of active and of associate members.

All members of the American Pharmaceutical Association, in good standing, residing in the county of Philadelphia shall be accredited as being associate members of this branch.

All members of the American Pharmaceutical Association residing in, or within a radius of seventy-five miles of the city of Philadelphia, may, on signifying their intention of adhering strictly to the provisions enumerated in the preamble, and in the constitution of the American Pharmaceutical Association, be elected to active membership in this branch.

**Officers**—The officers of this branch shall be a president, two vice-presidents and a secretary-treasurer.

**Executive Committee**—The officers of this branch shall constitute an executive committee to transact all necessary business connected with the regular meetings of this branch.

**Meetings**—The meetings of this branch shall be held monthly, from October to May inclusive.

**Quorum**—Five members of this branch shall constitute a quorum.

**Dues**—Every active member of this branch shall annually contribute the sum of one dollar.

**Elections**—The officers shall be elected, by ballot, at the March meeting, and shall serve one year, or, until their successors shall have been elected.

**Presiding Officer**—In the absence of the president or vice-presidents at any stated meeting, the members present shall elect a presiding officer, *pro tempore*.

**Order of Business**—(1) Reading of the minutes of the last stated meeting; (2) Introduction of new members; (3) Nominations and elections; (4) Unfinished or referred business; (5) New business; (6) Scientific business. Adjournment.

**Rules of Order**—On all points not specifically mentioned in the rules governing this section, the by-laws of the American Pharmaceutical Association shall take precedence over other decisions or treatises on parliamentary rules.

The election of officers for the current year resulted in the selection of: Prof. Joseph P. Remington, president; William McIntyre, first vice-president; William L. Cliffe, second vice-president; M. I. Wilbert, secretary-treasurer.

Following the election of officers the chairman announced that several prominent medical men had honored the birth of this local section with their presence and suggested that some of them at least might be willing to express their opinions on the timeliness or the necessity of a movement of this kind.

In answer to this invitation, Dr. Solomon Solis Cohen, and Dr. Henry Beates, Jr., expressed their gratification at being able to be present at this the initial meeting of an association which they thought would prove to be an important factor in the advancement of scientific pharmacy and incidentally of the science of medicine.

Dr. Cohen welcomed the foundation of this local branch of the American Pharmaceutical Association, because, to him, it meant not alone the assurance of a more active pursuit of the science of pharmacy, on the part of the members of this local branch, but it also meant, to the medical practitioner, that the fact that a pharmacist is an active member of this local branch will be a guarantee of his trustworthiness and his integrity.

Dr. Henry Beates, Jr., the president of the Pennsylvania State Board of Medical Examiners, after congratulating the members present on the honor of having inaugurated this important step toward advancing the science of pharmacy, assured his hearers that with the improvements that are now being made, in the training given to future medical men, the coming medical practitioner will be more appreciative of true worth in the practice of pharmacy and that the time is not far distant when the conditions will warrant higher and better compensation for really capable pharmacists.

The meeting did not adjourn until a late hour and every one present appeared to feel that he had taken part in a meeting that would serve to mark the inauguration of a new era in the progress of pharmacy.

The second stated meeting of the Philadelphia Branch of the American Pharmaceutical Association was held on the evening of Tuesday, April 24th, in the hall of the College of Physicians, the subject for discussion being "The Immediate Object and the Aims of the Philadelphia Branch of American Pharmaceutical Association."

M. I. WILBERT, *Secretary.*

## PHILADELPHIA COLLEGE OF PHARMACY.

### MINUTES OF THE ANNUAL MEETING.

The annual meeting of the members of the Philadelphia College of Pharmacy was held March 26, 1906, in the Library, at 4 o'clock, the President, Howard B. French, presiding.

Twenty members were present.

The minutes of the quarterly meeting held December 26, 1905, were read and approved.

The minutes of the Board of Trustees for December 5, 1905, January 2, February 6 and 19, 1906, were read by the Registrar, J. S. Beetem, and approved.

The President read his annual report, from which are abstracted the following items:—

The repairs made to the buildings during the year 1904 were of such a permanent character that but few repairs have been necessary during the past year, and all the buildings are now in a fairly good condition.

The Committee on Property have added 34 new lockers—making 134 now in use—and it is desirable that during the coming summer additional lockers

should be provided. During the past year two new branches were added to the first year curriculum, Algebra and Pharmaceutical Latin, both compulsory. The third year Supplementary Course has proven very valuable to the students and greatly increases the efficiency of the class.

Eleven students have taken the special course in Bacteriology. Three students have taken a special course in Technical Microscopy. Seven students have taken special instruction in the Pharmaceutical Laboratory.

Thirty-one third year students, of whom fifteen are doing special thesis work, twenty-three second year students and one first year student are taking special instruction in the Chemical Laboratory.

Four of the students have died during the year. Eight members of the College have died during the year: Henry N. Rittenhouse, Henry Cramer, John Bley, Allen Shryock, Robert C. Brodie, Edward T. Dobbins, Joseph P. Bolton, M.D., Louis Koch.

Two members have resigned.

Three members were elected: Ambrose Hunsberger, Clarence L. Bonta and John J. Finney.

While the College has had no official notification, the newspapers report that the will of our late member, Edward T. Dobbins, provides a scholarship in the College.

Your College has continued to hold its foremost rank among educational institutions devoted to pharmaceutical learning. Its present standard of admission is sixteen Regent's counts, which make our graduates eligible for examination by any of the State Pharmacy Boards.

Examinations for admission are to be conducted by the State Department of Education. The examination of applicants has been placed in the hands of Dr. Edgar A. Singer, Associate Superintendent of Public Schools, City Hall, Philadelphia.

Your President again desires to commend your Alumni Association for its continued activity.

The Committee on Nominations reported nominees for officers, trustees and committees to be voted for at this meeting.

Prof. Sadtler, Chairman of the Publication Committee, reported as follows:—

The AMERICAN JOURNAL OF PHARMACY has been issued regularly during the past year and the financial statement presented is gratifying to the Committee. The number of subscribers is being maintained, and special efforts are being made at present to materially increase the number of subscribers. The best firms in the country are represented in the advertising columns. This is a time when it is peculiarly fitting to point to the class of advertising carried by the JOURNAL as journals are being brought to account and being judged by the character of their advertising matter. There is probably not a journal or magazine in the country that has so consistently and for so long maintained the integrity of its advertising columns. Donations of the JOURNAL and other publications were received from our fellow members Harry L. Stiles and Jacob S. Beetem.

Prof. Henry Kraemer, Editor of the AMERICAN JOURNAL OF PHARMACY, reported as follows :—

There are two features which have especially characterized the AMERICAN JOURNAL OF PHARMACY during the past year. These are the large amount of illustrative material and the number of biographical sketches. Special mention is made of the series of articles begun in the October number on "London Botanic Gardens," by P. É. F. Perrédès. This series of articles is a contribution from the Wellcome Research Laboratories established by Henry S. Wellcome, a graduate of this College. In addition to these papers by Mr. Perrédès we have published quite a number of very valuable papers of practical, educational, and scientific interest, including a series of papers on the New Pharmacopœia. The quarterly review on recent advances in pharmacy and allied subjects, by Mr. M. I. Wilbert, continues to be of very great interest and importance.

Mr. William McIntyre reported for the Committee on Pharmaceutical Meetings as follows :—

The Pharmaceutical Meetings have been held regularly during the year. Among those who have contributed or read papers were Joseph L. Lemberger, M. I. Wilbert, J. B. Moore, Thomas S. Wiegand, Henry Kraemer, Allen Shryock, Charles H. LaWall, Clayton M. Thrush, C. P. Gabell, Henry Leffmann, Edwin Leigh Newcomb, E. F. Cook, Virgil Coblenz, H. W. Wiley, and H. C. Wood, Jr. The collections of the College have been added to as a result of the meetings.

Joseph W. England, Curator of the Museum, reported as follows :—

The Museum is in good condition and has received a number of accessions during the past year. The collections of official preparations in the Reading Room for reference by students have been entirely changed since September 1, 1905, and replaced by preparations of the present United States Pharmacopœia. Your Curator wishes to present to the College on behalf of the Smith, Kline & French Company one of the older types of tablet machines. This machine was made in 1892 by Rhoades & Sears of Philadelphia, and was used as the model upon which the patent was granted. The College has received, in the past, other apparatus of historical value, and your Curator has a promise of more. These are now kept in the fire-proof vaults of the College, but, in time, steps will have to be taken for their special care in the Museum or elsewhere.

Thomas S. Wiegand, Ph.M., Librarian, made the following report :—

During the past year there have been added to the Library two hundred and sixty-five volumes. One hundred and fifty of these were the gift of our fellow member William A. Bullock. Four volumes of *Science* from Professor Sadtler. Two volumes of *Popular Science Monthly*, two volumes of *Science*, and two volumes of the *Journal* of the Franklin Institute from Mr. Craig D. Ritchie. A copy of the last edition of "Remington's Pharmacy" from the author. In



exchange for the AMERICAN JOURNAL OF PHARMACY have been received seventy-four domestic and thirty-two foreign periodicals, besides numerous consular reports, proceedings of societies, etc. A large number of publications from the Departments at Washington, and a number from State departments in different parts of the country have also been received, and a number were obtained by purchase. As usual, the Library has been consulted by many of the students, and professional men not connected with the College.

The annual election of officers and trustees was then held. Messrs. William McIntyre and E. F. Cook were appointed tellers. Letters were read from Walter V. Smith and Henry C. Blair declining to accept the nomination to the Board of Trustees, because of pressure of business and other duties.

The nominations were ordered reopened, and Jacob M. Baer and Warren H. Poley were nominated for membership in the Board of Trustees. The election resulted as follows: President, Howard B. French; First Vice-President, Mahlon N. Kline; Second Vice-President, R. V. Mattison; Treasurer, James T. Shinn; Corresponding Secretary, A. W. Miller; Recording Secretary, C. A. Weidemann; Curator, Joseph W. England; Librarian, Thomas S. Wiegand; Editor, Henry Kraemer.

Trustees: Walter A. Rumsey, Jacob M. Baer, and Warren H. Poley. Publication Committee: Samuel P. Sadtler, Wallace Procter, Henry Kraemer, Joseph W. England, Joseph P. Remington, Martin I. Wilbert and Miss Florence Yaple. Committee on Pharmaceutical Meetings: Joseph P. Remington, C. B. Lowe, Henry Kraemer, William L. Cliffe and William McIntyre.

Mr. Kline reported the death of Mr. Frederick Aschenbach as having occurred this day. Mr. Aschenbach was not a member of the College, but it was deemed appropriate to note his death because of his many years' connection with the drug trade of Philadelphia.

Professor Kraemer, in noting the presentation of a tablet machine from the Smith, Kline & French Company, moved that the thanks of the College be tendered the donors for the valuable accession to the museum. Seconded, and so ordered.

A pleasant incident of this meeting was the announcement that this day was the anniversary of the birth of Professor Remington, when congratulations were tendered him and the hope expressed that he might be spared to us for many years.

The president appointed William McIntyre, M. N. Kline, C. B. Lowe, Charles H. LaWall and Joseph W. England as delegates to

the Pennsylvania Pharmaceutical Association meeting at Glen Summit, on June 26th, 27th and 28th.

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

*December 5, 1905.*—Thirteen members were present. The Committee on Instruction reported that they were engaged on the subject of entrance examinations.

The Committee on Examinations recommended that a list of suitable books be prepared for the use of students in preparation for entrance examinations, and that the list be published in the next announcement. This list of books is to be suggested by the State Superintendent of Public Instruction.

A communication was read from Dr. C. P. Franklin, Assistant Medical Director of the Garretson Hospital, offering the use of the hospital to the students whenever so needed.

*January 2, 1906.*—Thirteen members were present. The Committee on Library reported numerous additions to the library by presentation, purchase, and exchange.

The chairman of the Board, in calling attention to the recent gifts, stated the necessity for better protection for our valuable books and suggested that arrangements be made for such protection. The suggestion met with approval and was referred to a joint committee consisting of the Committee on Property and Committee on Library.

Mr. Cliffe, on behalf of the State Board of Pharmacy, expressed their appreciation of the courtesies extended by the Board of Trustees in allowing them the use of rooms in the College in which to conduct their examinations.

*February 6, 1906.*—Fifteen members were present. It was voted that in future the Seal of the College be attached on Certificates of Proficiency in Chemistry. The Committee on Library reported a number of accessions to the library.

The Committee on Instruction reported very fully the requirements necessary for admission to the College, including list of books and studies. This report will be published in the forthcoming Announcement. Mr. Leedom, on behalf of the Philadelphia Association of Retail Druggists, expressed the thanks of the Association for courtesies extended by the Board of Trustees.

*Special Meeting, February 19, 1906.*—Eleven members were present. The chairman stated that the meeting was called to take action upon the death of Edward T. Dobbins, who, for the past six years was a member of the Board. Remarks were made by Messrs. French, Remington, Boring and others, relative to Mr. Dobbins' active life and his interest in the Philadelphia College of Pharmacy.

It was moved that the Board of Trustees attend the funeral services from his late residence, 1808 South Rittenhouse Square, on Tuesday, February 20th; also that appropriate resolutions be drawn by a committee of three, and a copy be sent to the family. This was agreed to, and the chairman appointed Messrs. Remington, French and Shoemaker.

CHARLES A. WEIDEMANN, M.D.,  
*Recording Secretary.*